

## University of Groningen

### **Informatie, communicatie en economische organisatie; een poging tot synthese**

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## SUMMARY

- 1 The starting point of this study concerning information, communication and economic organisation lies in the fact that in economic systems the decision-making units do not dispose instantly of the information necessary to arrive at the optimal economic decisions.

The aim of this study is to determine the most efficient way in which this indispensable information can be transmitted to the decision-making units.

- 2 For this purpose first of all the minimum information, needed by the economic subjects for their optimal decisions, is analysed (Chapter II). This analysis is based on an allocation model in which decreasing marginal utility to consumers, decreasing marginal product to producers, absence of external effects and absence of a public sector in a closed economy are assumed. It is shown that a set of market prices is the only information needed. Under the assumptions, stated in the preceding paragraph, complete decentralisation of decision-making is possible and this implies the possibility of certain economic organisation patterns.

In the same chapter a criterion for the efficiency of information and communication in economic adjustment processes is developed. As the speed of adjustment is the most important feature in such an economic process, this speed and its reciprocal : the adjustment time, are chosen as the bases for information efficiency.

Furthermore, the notions of information and communication are formalised in such a way as to make them measurable in bits (binary digits), at least in principle. To obtain this result information theory is drawn upon.

- 3 In Chapter III an information and communication model is constructed, using those aspects of the decision-making and communication procedures which seem most relevant for the purpose, such as the shape of the communication network, the quantity and character of the information processed. These features of the model also enable to state more explicitly some aspects of economic organisation in terms of information and communication, e.g. the difference between (de)centralisation of decision-making and of information.

The information and communication model is used to analyse to what extent the classical price adjustment system is more information-efficient than comparable adjustment systems of decentralised decision-making. It is made clear that under the assumptions made, the classical system is in fact most information-efficient, if the means of communication available are quantitatively and qualitatively sufficient.

- 4 In Chapter IV the interdependence between the maximum information efficiency of the completely decentralised market price system and the classical assumptions made in the original allocation model is analysed by means of manipulating the conditions of that model. It is found that e.g. increasing marginal returns in production do not prevent every form of completely decentralised decision-making, but at the same time require more centralised information and communication. On the other hand, external effects will disturb the completely decentralised decision-making. In this situation more centralised decision-making is inevitable.

The information-efficiency in situations of more centralised economic organisation need not be less than in a comparable situation of decentralisation. Factors of importance are here the quantity and the quality of the available means of communication and computation.

- 5 One important result of this study is the conclusion that the price system does not without more ado possess maximum information efficiency when decision-making is completely decentralised (Chapter V).

Environmental and psychological factors, such as fundamental economic relations and the available means of communication in fact to a large extent determine the organisational form of an economy as well as the type of economic decision-making. The speed of "information diffusion" through the economy is an essential variable, and is itself strongly related to the factors mentioned above.

A few remarks are made, finally, about the fundamental assumptions used in the information and communication model. One of them relates to the invariable means of communication and computation in the economies studied. This assumption rules out all problems of communication cost. Other restrictions are those concerning the use of a unique speed of information transmission and a completely homogeneous communication network in the economy. To relax the restrictions of this type, more work will be necessary both in the theoretical and the practical field.